

BS ISO 13171:2016



BSI Standards Publication

**Essential oil of oregano**  
**[*Origanum vulgare* L. subsp.**  
***hirtum* (Link) letsw]**

**National foreword**

This British Standard is the UK implementation of ISO 13171:2016.

The UK participation in its preparation was entrusted to Technical Committee AW/54, Essential oils.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016.  
Published by BSI Standards Limited 2016

ISBN 978 0 580 86887 0

ICS 71.100.60

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2016.

**Amendments/corrigenda issued since publication**

| Date | Text affected |
|------|---------------|
|------|---------------|

---

INTERNATIONAL  
STANDARD

**ISO**  
**13171**

First edition  
2016-08-01

---

---

**Essential oil of oregano [*Origanum  
vulgare* L. subsp. *hirtum* (Link) letsw]**

*Huile essentielle d'origan [Origanum vulgare L. subsp. hirtum  
(Link) letsw]*



Reference number  
ISO 13171:2016(E)

© ISO 2016



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

# Contents

|   | Page     |
|---|----------|
| Foreword .....  | iv       |
| <b>1 Scope .....</b>  | <b>1</b> |
| <b>2 Normative references .....</b>   | <b>1</b> |
| <b>3 Terms and definitions .....</b>  | <b>1</b> |
| <b>4 Requirements .....</b>   | <b>1</b> |
| <b>5 Flash point .....</b>  | <b>2</b> |
| <b>6 Sampling .....</b>   | <b>2</b> |
| <b>7 Packaging, labelling, marking and storage .....</b>  | <b>3</b> |
| <b>Annex A (informative) Typical chromatograms of the analysis by gas chromatography of<br/>the essential oil of oregano [<i>Origanum vulgare</i> L. subsp. <i>hirtum</i> (Link) letsw] .....</b> | <b>4</b> |
| <b>Annex B (informative) Flashpoint .....</b>   | <b>7</b> |
| <b>Bibliography .....</b>   | <b>8</b> |

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword – Supplementary information](#)

The committee responsible for this document is ISO/TC 54, *Essential oils*.

# Essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw]

## 1 Scope

This International Standard specifies certain characteristics of the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw], in order to facilitate the assessment of its quality.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TS 210, *Essential oils — General rules for packaging, conditioning and storage*

ISO/TS 211, *Essential oils — General rules for labelling and marking of containers*

ISO 212, *Essential oils — Sampling*

ISO 279, *Essential oils — Determination of relative density at 20 °C — Reference method*

ISO 280, *Essential oils — Determination of refractive index*

ISO 592, *Essential oils — Determination of optical rotation*

ISO 875, *Essential oils — Evaluation of miscibility in ethanol*

ISO 11024 (all parts), *Essential oils — General guidance on chromatographic profiles*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **essential oil of oregano**

essential oil obtained by steam distillation of the flowering tops of *Origanum vulgare* L. subsp. *hirtum* (Link) letsw, of the Lamiaceae family, growing mainly in Germany, Netherlands and Hungary

Note 1 to entry: For information on the CAS number, see ISO/TR 21092.

## 4 Requirements

4.1 Essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw] shall meet the requirements as given in [Table 1](#).

**Table 1 — Requirements for the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw]**

| Characteristics  | Requirements  | Test method |
|--|---|-------------|
| Appearance   | Clear, mobile liquid  | —           |
| Colour   | Yellow to dark brownish red   | —           |
| Odour  | Characteristic, aromatic, phenolic, with a slightly spicy base  | —           |
| Relative density at 20 °C $d_{20}^{20}$                  | 0,930 - 0,955   | ISO 279     |
| Refractive index at 20 °C                                | 1,500 - 1,513   | ISO 280     |
| Optical rotation at 20 °C                                | Between -5° and +2°   | ISO 592     |
| Miscibility in ethanol, 80 % (volume fraction), at 20 °C | It shall not be necessary to use more than 2 volumes of ethanol, 80 % (volume fraction), to obtain a clear solution with 1 volume of essential oil.<br><br>Sometimes opalescence can arise on continuing the addition of ethanol. | ISO 875     |

**4.2** Carry out the analysis of the essential oil by gas chromatography. Determine the chromatographic profile in accordance with ISO 11024 (all parts). Identify in the chromatogram obtained, the representative and characteristic components shown in [Table 2](#). The proportions of these components, indicated by the integrator, shall be as shown in [Table 2](#). This constitutes the chromatographic profile of the essential oil.

**Table 2 — Chromatographic profile**

| Component   | Minimum %           | Maximum % |
|---|---------------------|-----------|
| $\alpha$ -Thujene   | 0,2                 | 1,5       |
| $\alpha$ -Pinene  | 0,2                 | 2,5       |
| Myrcene   | 0,5                 | 3,0       |
| $\alpha$ -Terpinene   | 0,5                 | 2,0       |
| <i>p</i> -Cymene  | 4,0                 | 10,0      |
| $\gamma$ -Terpinene   | 3,0                 | 9,0       |
| Linalool  | traces <sup>a</sup> | 3,0       |
| Terpinen-4-ol   | 0,5                 | 2,0       |
| Thymol  | 0,5                 | 5,0       |
| Carvacrol   | 60,0                | 80,0      |
| $\beta$ -Caryophyllene  | 0,5                 | 4,0       |
| <sup>a</sup> traces: < 0,01 %.<br>NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in <a href="#">Annex A</a> . |                     |           |

## 5 Flash point

Information on the flash point is given in [Annex B](#).

## 6 Sampling

Sampling shall be performed in accordance with ISO 212.



Minimum volume of test sample: 25 ml.

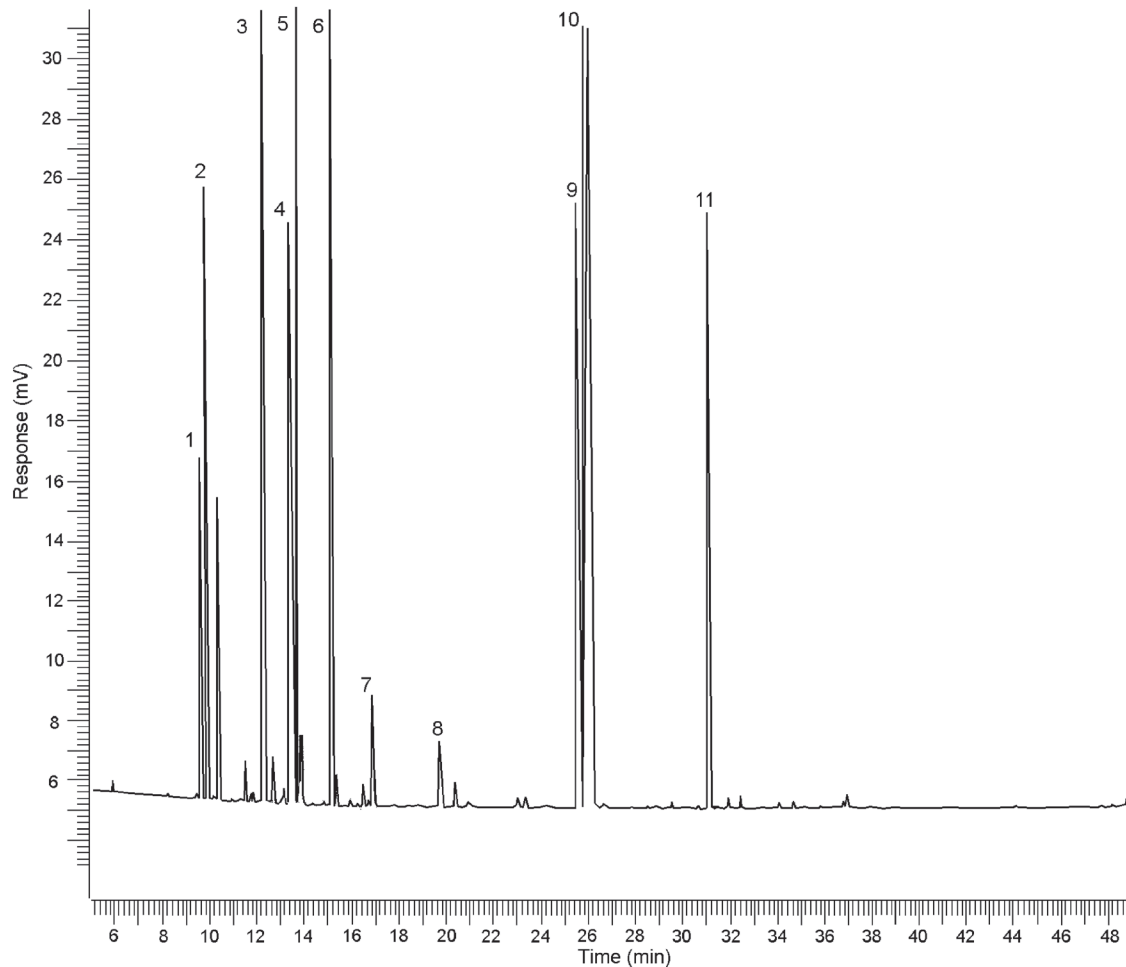
NOTE This volume allows each of the tests specified in this International Standard to be carried out at least once.

## **7 Packaging, labelling, marking and storage**

These items shall be in accordance with ISO/TS 210 and ISO/TS 211.

**Annex A**  
(informative)

**Typical chromatograms of the analysis by gas chromatography of  
the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum*  
(Link) letsw]**



**Peak identification**

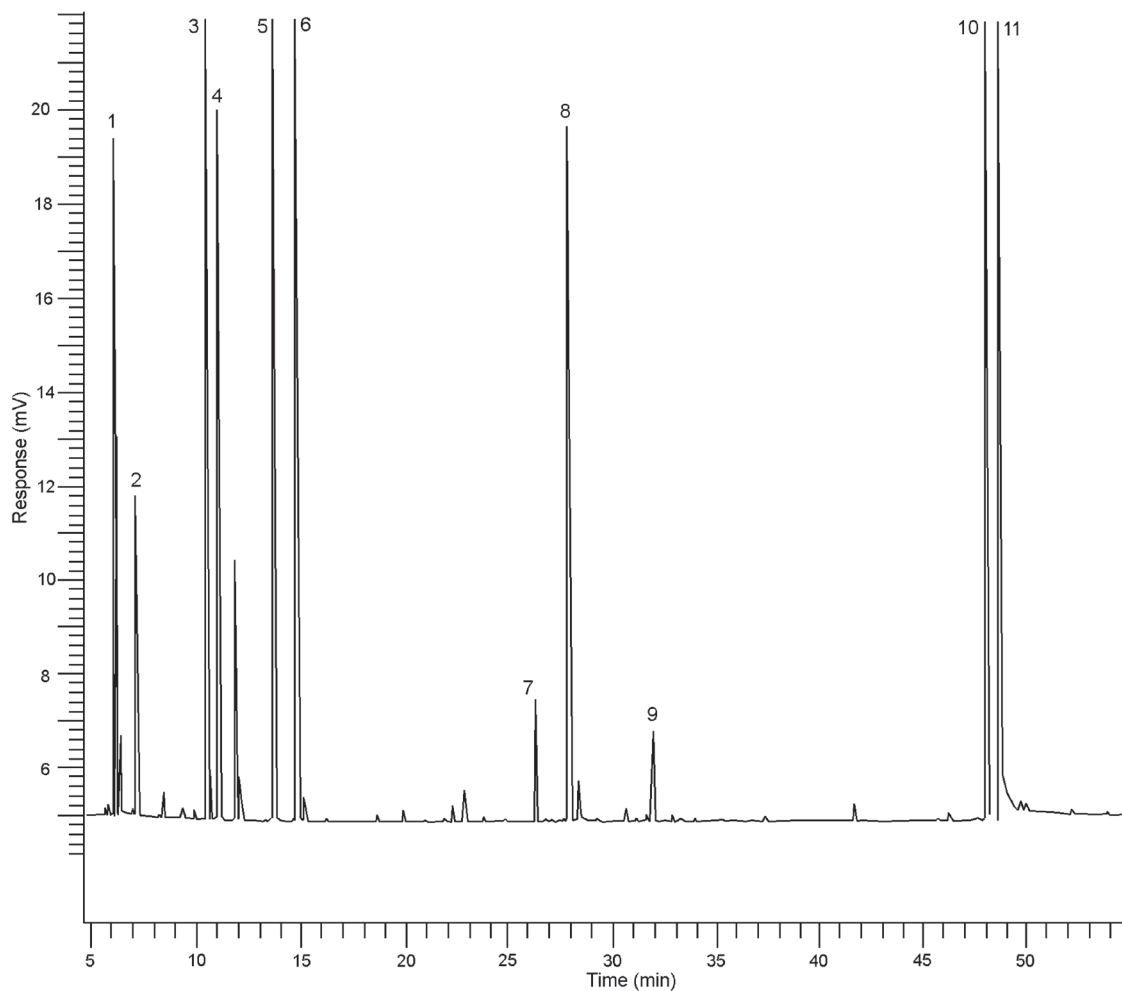
- 1  $\alpha$ -Thujene
- 2  $\alpha$ -Pinene
- 3 Myrcene
- 4  $\alpha$ -Terpinene
- 5 *p*-Cymene
- 6  $\gamma$ -Terpinene
- 7 Linalool
- 8 Terpinen-4-ol
- 9 Thymol
- 10 Carvacrol
- 11  $\beta$ -Caryophyllene

**Operating conditions**

Column: fused capillary silica, 30 m length, 0,25 mm internal diameter  
 Stationary phase: SPB™ -1 (SE-30)<sup>a</sup>  
 Film thickness: 0,25  $\mu$ m  
 Oven temperature: programming temperature from 50 °C to 180 °C at a rate of 3 °C/min and 180 °C to 220 °C at a rate of 10 °C/min  
 Injector temperature: 260 °C  
 Detector temperature: 280 °C  
 Detector: flame ionization type  
 Carrier gas: helium  
 Volume injected: 1  $\mu$ l  
 Carrier gas flow rate: 1 ml/min  
 Split ratio: 1/50

<sup>a</sup> SPB™ -1 (SE-30) is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product

**Figure A.1 — Typical chromatogram taken on an apolar column**



**Peak identification**

- 1  $\alpha$ -Pinene
- 2  $\alpha$ -Thujene
- 3 Myrcene
- 4  $\alpha$ -Terpinene
- 5 *p*-Cymene
- 6  $\gamma$ -Terpinene
- 7 Linalool
- 8  $\beta$ -Caryophyllene
- 9 Terpinen-4-ol
- 10 Thymol
- 11 Carvacrol

**Operating conditions**

Column: fused capillary silica, 30 m length, 0,25 mm internal diameter  
 Stationary phase: Supelco Wax™ -10<sup>a</sup>  
 Film thickness: 0,25  $\mu$ m  
 Oven temperature: programming temperature from 50 °C to 180 °C at a rate of 3 °C/min and 180 °C to 220 °C at a rate of 10 °C/min  
 Injector temperature: 260 °C  
 Detector temperature: 280 °C  
 Detector: flame ionization type  
 Carrier gas: helium  
 Volume injected: 1  $\mu$ l  
 Carrier gas flow rate: 1 ml/min  
 Split ratio: 1/50

<sup>a</sup> Supelco Wax™ -10 is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product

**Figure A.2 — Typical chromatogram taken on a polar column**

## **Annex B** **(informative)**

### **Flashpoint**

#### **B.1 General information**

For safety reasons, transport companies, insurance companies, and people in charge of safety services require information on the flash points of essential oils, which in most cases are flammable products.

A comparative study on the relevant methods of analysis (see ISO/TR 11018) concluded that it was difficult to recommend a single apparatus for standardization purposes, given that:

- there is a wide variation in the chemical composition of essential oils;
- the volume of the sample needed in certain requirements would be too costly for high priced essential oils;
- as there are several different types of equipment which can be used for the determination, users cannot be expected to use one specified type only.

Consequently, it was decided to give a mean value for the flashpoint annexed to each International Standard, for information, in order to meet the requirements of the interested parties.

The equipment with which this value was obtained shall be specified.

For further information see ISO/TR 11018.

#### **B.2 Flashpoint of the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) Letsw]**

The mean value is +65 °C.

NOTE Obtained with “closed cup”<sup>1)</sup> equipment.

---

1) Equipment available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.

## Bibliography

- [1] ISO 3218, *Essential oils — Principles of nomenclature*
- [2] ISO/TR 11018:1997, *Essential oils — General guidance on the determination of flashpoint*
- [3] ISO/TR 21092, *Essential oils — Characterization*









# British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

## About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

## Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at [bsigroup.com/standards](http://bsigroup.com/standards) or contacting our Customer Services team or Knowledge Centre.

## Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at [bsigroup.com/shop](http://bsigroup.com/shop), where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

## Copyright in BSI publications

All the content in BSI publications, including British Standards, is the property of and copyrighted by BSI or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use.

Save for the provisions below, you may not transfer, share or disseminate any portion of the standard to any other person. You may not adapt, distribute, commercially exploit, or publicly display the standard or any portion thereof in any manner whatsoever without BSI's prior written consent.

## Storing and using standards

Standards purchased in soft copy format:

- A British Standard purchased in soft copy format is licensed to a sole named user for personal or internal company use only.
- The standard may be stored on more than 1 device provided that it is accessible by the sole named user only and that only 1 copy is accessed at any one time.
- A single paper copy may be printed for personal or internal company use only.

Standards purchased in hard copy format:

- A British Standard purchased in hard copy format is for personal or internal company use only.
- It may not be further reproduced – in any format – to create an additional copy. This includes scanning of the document.

If you need more than 1 copy of the document, or if you wish to share the document on an internal network, you can save money by choosing a subscription product (see 'Subscriptions').

## Reproducing extracts

For permission to reproduce content from BSI publications contact the BSI Copyright & Licensing team.

## Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to [bsigroup.com/subscriptions](http://bsigroup.com/subscriptions).

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

**PLUS** is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit [bsigroup.com/shop](http://bsigroup.com/shop).

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email [subscriptions@bsigroup.com](mailto:subscriptions@bsigroup.com).

## Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

## Useful Contacts

### Customer Services

**Tel:** +44 345 086 9001

**Email (orders):** [orders@bsigroup.com](mailto:orders@bsigroup.com)

**Email (enquiries):** [cservices@bsigroup.com](mailto:cservices@bsigroup.com)

### Subscriptions

**Tel:** +44 345 086 9001

**Email:** [subscriptions@bsigroup.com](mailto:subscriptions@bsigroup.com)

### Knowledge Centre

**Tel:** +44 20 8996 7004

**Email:** [knowledgecentre@bsigroup.com](mailto:knowledgecentre@bsigroup.com)

### Copyright & Licensing

**Tel:** +44 20 8996 7070

**Email:** [copyright@bsigroup.com](mailto:copyright@bsigroup.com)

### BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK